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FINAL REPORT

FOR

LEROY ANDERSON DAM INUNDATION STUDY

March 6, 1992

Prepared for:

SANTA CLARA VALLEY WATER DISTRICT

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INTRODUCTION

This report presents the results of Leroy Anderson Dam Inundation Study. The study was carried out to investigate the impact of the failure of Leroy Anderson Dam on the downstream areas of Santa Clara Valley, should such a failure occur. The study was conducted in accordance with current guidelines of the California Office of Emergency Services (OES) and also with the Emergency Action Plans (EAP) Guidelines prepared by the United states Federal Energy Regulatory Commission (FERC), issued February 22, 1988.

BACKGROUND

Section 8589.5 of the California Emergency Services Act and Section 12.20(a) of the FERC's Regulations require that inundation maps showing the areas of potential flooding in the event of failure of any dam be prepared and submitted. This study was conducted to fulfill the above-mentioned requirements.

PREVIOUS STUDIES

The original dambreak and inundation study was conducted in 1974 by Santa Clara Valley Water District (SCVWD). Inundation maps prepared in that study are available at SCVWD (Reference 1). The study apparently assumed the failure of Coyote Dam caused the failure of Anderson Dam (letter from Eric Orma, California OES, to David Gill, SCVWD, dated March 25, 1974).

SCVWD investigated a hypothetical failure of Coyote Dam and its effect on Leroy Anderson Reservoir in a 1985 study (Reference 2). The study concluded that Leroy Anderson Dam would not be overtopped if the areas where the dam crest had settled to below 640.0 feet elevation were restored to the original elevation. The report did not consider downstream flooding.

Flood Insurance Rate Maps (FIRMs) are available for Coyote Creek, Canoas Creek and Guadalupe River. These streams are located downstream of Leroy Anderson Dam in the northern portion of Santa Clara Valley. FIRMs are also available for Llagas Creek and Pajaro River in the southern portion of the Santa Clara Valley.

DESCRIPTION OF STUDY AREA

Dam Location

Leroy Anderson Dam is located at approximately longitude 121° 37' West and latitude 37° 10' North, Santa Clara County, California. The dam is located on Coyote Creek approximately 11 miles southeast of San Jose, California, and three miles north of Morgan Hill (Figure 1). It is approximately five miles northwest of Coyote Lake.

Dam and Reservoir Description

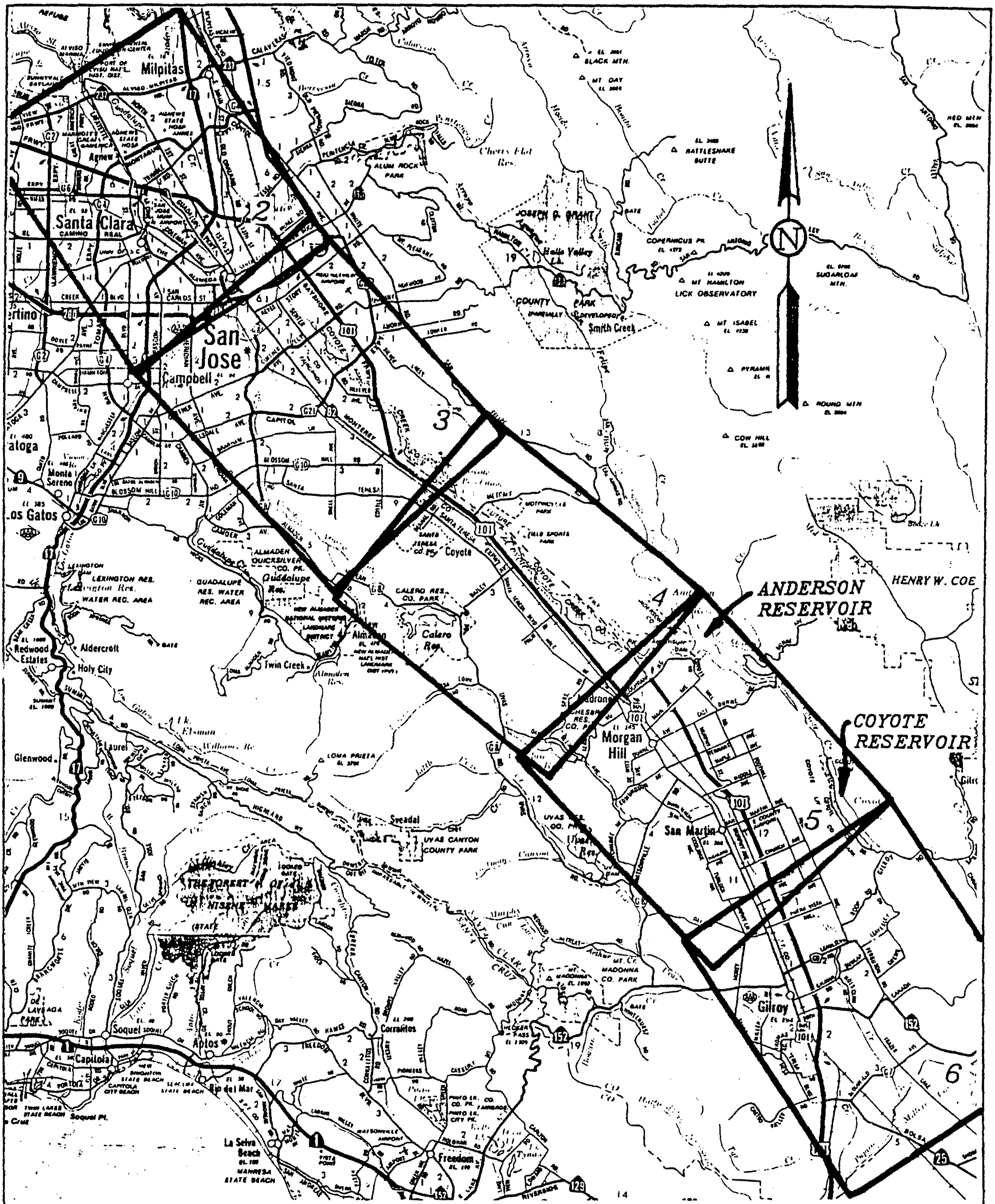
The dam is a zoned earth-rock embankment with a maximum height of approximately 240 feet from the streambed to the crest, 1,400 feet long and 40 feet wide at crest elevation 644.5.

The reservoir is 0.25 mile wide and 7.5 miles long. It extends in a northwest to southeast alignment and it parallels the dam. The capacity of the reservoir is approximately 91,280 acre-feet at spillway crest elevation of 625.0 feet (Reference 3).

Santa Clara Valley

Santa Clara Valley extends in a northwest and southeast direction and it lies immediately downstream of the dam. A grade break occurs in the vicinity of the dam so that the valley floor slopes away from the dam in either direction. In the event of a dam failure, therefore, the flow from the reservoir would be divided with part of the flow going towards San Jose in the northwest and the other part going towards Gilroy in the southeast. Except for overpass crossings, roads and railroads are close to existing ground elevation. The railroad is slightly elevated in some locations but it is not expected to have any major impact on the flows in the event of dam failure.

a. Northwest Valley -- The northwest portion of the valley is approximately two miles wide in the vicinity of the dam. At



NO SCALE

LEROY ANDERSON DAM
INUNDATION STUDY

LOCATION MAP

ENSIGN & BUCKLEY
CONSULTING ENGINEERS
SACRAMENTO

approximately seven miles northwest of the dam, the valley suddenly narrows to approximately 1.3 miles. At a distance of 8.5 miles northwest of the dam, the valley further narrows to approximately 0.4 mile. This narrowing is caused by Tulare Hill jutting into the valley. Beyond Tulare Hill, the valley expands westwards leaving Coyote Creek, which flows along the east side of the valley, following a straight course. A low hill with a peak elevation of 325 feet separates Coyote Creek from the rest of the valley leaving the hill as an island. The island extends from Mile 12 to approximately Mile 14.5 northwest of the dam. Another low hill with peak elevation of 435 feet forms another island on the left side of the valley between Capitol Expressway to the south and Tully Road to the north. Coyote Creek rejoins the main valley in the vicinity of Capitol Expressway, near the north end of the first island. Upper Silver Creek flows into Coyote Creek at this location (Reference 4).

At approximately 14 miles northwest of the dam, Guadalupe River emerges from the hills into the valley and it flows approximately two miles west of and parallel to Coyote Creek. The valley expands rapidly in both east and west directions until it reaches the south end of San Francisco Bay. Coyote Creek and Guadalupe River continue along the valley until they reach sea level at Mile 27.5 and then flow into the San Francisco Bay.

From the dam to Tulare Hill, the valley is mostly rural with scattered houses and agricultural fields. The rest of the northwest valley is urban.

b. Southeast Valley -- The southern portion of Santa Clara Valley is approximately three miles wide just downstream of Leroy Anderson Dam. The valley width increases to approximately four miles before a promontory narrows it down to two miles at a location five miles southeast of the dam. The valley immediately widens to three miles beyond the promontory and continues to widen evenly to San Benito County boundary at the Pajaro River. The southeast valley is drained by Llagas Creek and its tributaries, until at Gilroy where Uvas Creek emerges into the valley. The two creeks continue southwards to Pajaro River. The Pajaro River cuts through Santa Cruz Mountains forming a narrow valley as it continues west to the Pacific Ocean.

The southeast valley is mostly rural with scattered houses in a wide approximately flat-bottomed valley.

ANALYSIS AND RESULTS

In implementing the Leroy Anderson Dam inundation study, the following tasks were carried out:

1. Collect and review available data;
2. Evaluate outflow hydrograph;
3. Route outflow downstream;
4. Plot inundation boundaries;
5. Prepare summary report.

A detailed description of how each of the above tasks was carried out is recounted below.

Collect and Review Available Data

Available information, including existing inundation maps, USGS 7.5-minute quadrangle maps, construction plans for the dam and flood insurance rate maps for Santa Clara County were provided by Santa Clara Valley Water District. The following reports were also provided:

a. *Inspection and Safety Review - Leroy Anderson Dam,* prepared for Santa Clara Valley Water District, Wahler Associates, August 1986.

b. *Planning Study Consisting of the Engineer's Report and Draft Negative Declaration for Modifications to Leroy Anderson Dam,* Santa Clara Valley Water District, August 1985.

c. *Analysis of a Hypothetical Coyote Dam Failure and the Resulting Impact on Anderson Reservoir,* Santa Clara Valley Water District, February 1985.

In addition to the information provided by the District, data was collected from field visits conducted by Ensign & Buckley Consulting Engineers, flood insurance rate maps for the entire valley, and tide levels for East San Francisco Bay (Reference 5). The collected information was reviewed and evaluated for incorporation into the current study.

Evaluate Outflow Hydrograph

In accordance with both OES and FERC guidelines, an erosional mode of failure was selected for Leroy Anderson Dam which is an earthfill structure. The water level in the reservoir was assumed to be at the spillway lip at the time of failure. This condition constitutes a "fair weather dam break" and it is considered to have the most potential for loss of life. The maximum outflow was estimated from the following equation from OES Guidelines (Reference 6):

$$Q_{Max} = CH^{2.5}$$

Where Q_{Max} = Maximum discharge through the breach in cubic feet per second (cfs)

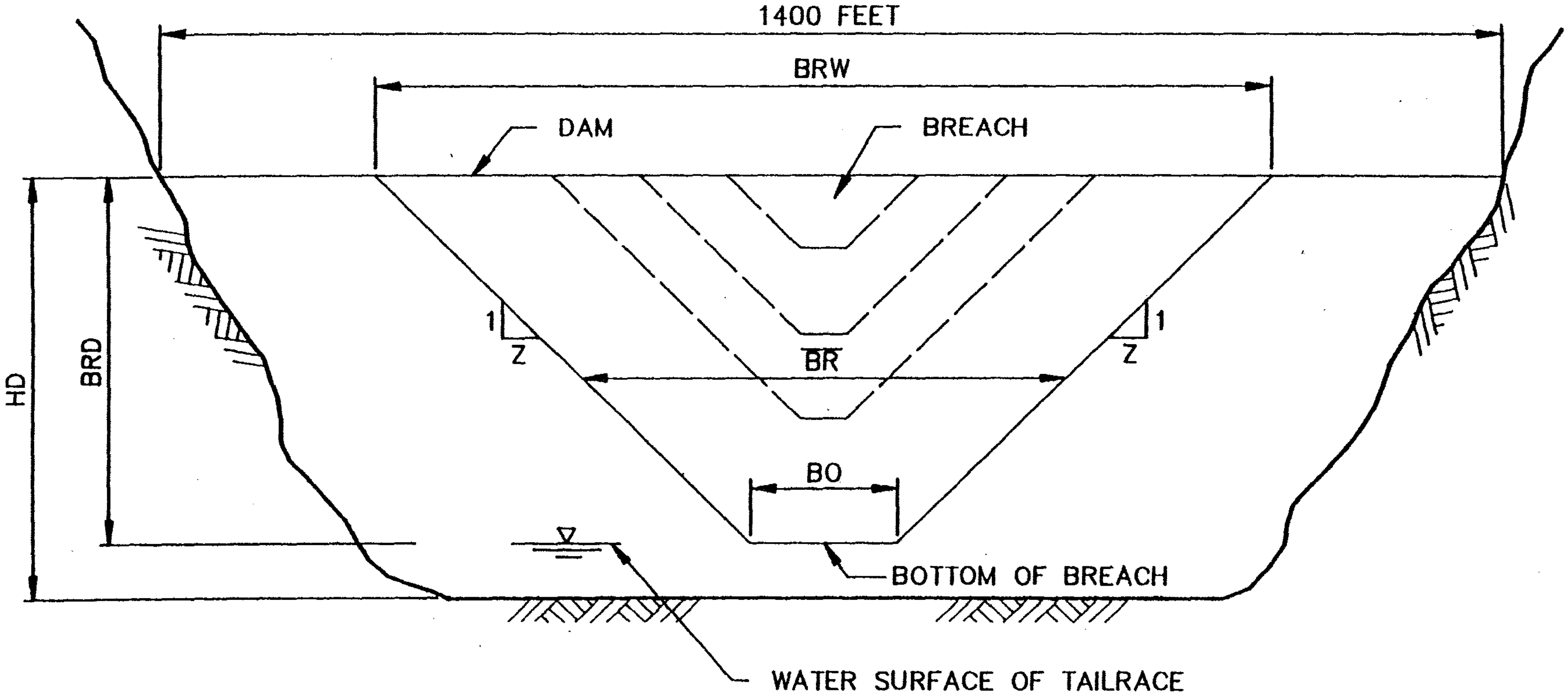
C = coefficient that varies with breach shape

H = depth of water in feet at one-half reservoir capacity

A parabolic breach with top width about three times the depth was assumed. The C coefficient was therefore chosen as 5.0 (Figure 2).

The storage capacity of Anderson Reservoir at spillway level is approximately 91,280 acre-feet (Reference 8). The depth of water at one-half capacity (45,640 acre-feet) was estimated at 142 feet (Appendix A). Using the equation provided in OES guidelines, the peak outflow, Q_{Max} was estimated to be 1.2 million cfs. Using an isosceles triangle with Q_{Max} at the apex and the area under the hydrograph equal to the storage volume in the reservoir, the time base of the hydrograph was calculated to be 1.8 hours. The time to failure was therefore estimated to be 0.9 hour. This is consistent with the suggested time to failure for earthen dams contained in Table 1 of FERC guidelines.

Using the National Weather Service BREACH computer model, the peak outflow for the reservoir at spillway level was estimated to be 1.18 million cfs which represents a difference of only 1.7%. The time of failure was approximately 1.10 hours, the side slope of the breach was approximately 0.80. According to FERC guidelines, the time to failure should be between 0.1 and 4.0 hour and the side slope should be between 1/4 and 1. The closeness of the parameters of both methods to the National Weather Service BREACH parameters indicates that the two methods wwould give similar results. Therefore a peak outflow of 1.2 million cfs was used in this analysis.



BRD DEPTH OF BREACH = 213.5 FT.
BRW TOP WIDTH OF BREACH = 457.3 FT.
HD HEIGHT OF DAM = 213.5 FT.
Z SIDE SLOPE OF BREACH = 1.0 FT.
TFH TIME OF FAILURE = 1.9 HR.
BO BOTTOM WIDTH OF BREACH = 47.6 FT.
$\overline{BR}$ AVERAGE WIDTH OF BREACH = 252.6 FT.

LEROY ANDERSON DAM
INUNDATION STUDY

ASSUMED BREACH FOR LEROY ANDERSON DAM

FIGURE 2

Route Outflow Downstream

a. Split Flow Analysis -- As discussed in the section entitled "Description of Study Area", a grade-break occurs in Santa Clara Valley in the vicinity of Leroy Anderson Dam. In the event of failure of Leroy Anderson Dam, the water from the reservoir is expected to be divided into two parts which would flow in opposite directions. Part of the flow would travel along the valley northwest to San Jose and San Francisco Bay while the other part would travel southeast to Gilroy and Pajaro River. Much turbulence is expected to occur at the grade break resulting in appreciable loss of energy.

The division of flow into two parts was estimated using the conservation of momentum principle (Appendix B). Cross sections at locations 0.5 mile downstream of the dam in either direction were used as boundaries to the control volume on which the forces and momentums would act. Flow parameters for the cross sections are shown in Table B-1 and Table B-2. The principle was applied to the peak flow of the outflow hydrograph assuming that the rest of the outflow would divide in the same ratio as the split at the peak of the outflow hydrograph. The peak flow from the reservoir was estimated to be split so that 555,000 cfs would flow northwest towards San Jose and 645,000 cfs would flow southeast towards Gilroy (Figure B-1).

The flows were increased by 10% in either direction to account for uncertainties in estimating the outflow hydrograph and the split flow analysis. The actual peak flows used in the DAMBRK model were 611,000 cfs flowing northwest and 710,000 cfs flowing southeast.

b. Flow Routing -- Cross sections were taken from the most current USGS maps at 0.5 mile intervals along the length of the valley from the dam northwest to Mud Slough near Milpitas and from the dam southeast to Pajaro River. Manning's roughness values were estimated using available maps and from field visits. An average Manning's roughness value of 0.06 was estimated for use in the computer model. The National Weather Service DAMBRK computer model for unsteady flow was used to route the split flows in the respective portions of Santa Clara Valley.

An antecedent flow rate of 10,000 cfs was used to start the DAMBRK model. This value would not influence the computed flood waves of 611,000 cfs and 710,000 cfs.

1) Northwest Valley

The northwest portion of Santa Clara Valley was routed with an initial peak discharge of 611,000 cfs (Appendix C). The flow was attenuated to approximately 311,000 cfs at 8.5 miles downstream of the dam. This is the location where Tulare Hill juts into the valley, narrowing the flow width to approximately 0.4 mile. The maximum flood elevation was approximately 262 feet and the maximum velocity was approximately 10.0 fps. It would take the flood wave approximately 1.5 hours to arrive at this location. It is expected that dead storage would occur along the west side of the valley downstream of Tulare Hill because the flow would not expand as abruptly as the valley does. The flow was assumed to expand at the rate of 4 to 1 between Mile 9.0 and Mile 14.0. A similar expansion is expected to occur on the east side of the valley at a location 15.5 miles downstream of the dam.

At Mile 16.5, which is located just upstream of Tully Road, the flood wave would be attenuated down to approximately 167,000 cfs, the maximum velocity would be 4.2 fps.

The flood flow would be attenuated progresively downstream until the end of the routing reach at Mile 27.5 where an average high tide level of 4.0 feet was assumed to occur in accordance with OES guidelines. At Mile 26.5, the flow would pose no threat to human life as defined by OES since this is the point where the product of depth of flow in feet and velocity in feet per second would be approximately equal to 6. The DAMBRK run summary sheet for northwest valley shows the maximum flow, elevation, velocity, time of arrival of flood wave after dam failure and the product of depth and velocity (Appendix C1).

2) Southeast Valley

The southeast portion of Santa Clara Valley was routed with an initial peak discharge of 710,000 cfs. The flow was attenuated down to approximately 550,000 cfs at Mile 5 where the valley narrows suddenly from 3 miles to 2 miles wide. The impact of the constriction can be seen in the decrease and then increase in flow velocities as the peak flow approached Mile 5 (Appendix C2). As the valley widens downstream, the maximum flow was attenuated and the velocities decreased once more. The maximum flow continued to decrease to the end of the routing reach at Mile 18.3 where Pajaro River enters a narrow valley as it cuts across the Santa Cruz Mountains. Velocities decreased until at Mile 17.0 when the valley began to narrow again. The maximum water surface elevation continued to decrease until the backwater from the downstream constriction began to impact the water surface starting at Mile 15.5. From Mile 15.5 to Mile 18.3, the water surface would be approximately flat. It would take the flood wave approximately seven hours to arrive at the end of the routing reach at Mile 18.3. The product of depth and velocity would not be less than six at any location in the routing reach. The "no threat to human life" criterion would therefore not be satisfied. The DAMBRK run summary table for southeast valley shows maximum flow, elevation, velocity, time of arrival of flood wave after dam failure and the product of depth and velocity (Appendix C2).

Plot Inundation Boundaries

After the DAMBRK model was run, the inundation boundaries were plotted on USGS 7.5-minute quadrangle maps. At 5- to 10-foot contour intervals many features do not stand out and as a result the plotting of inundation boundaries on the quadrangle maps were subjective. Flood insurance maps and flood profiles were used where these maps are available to fill in details. Much care and effort were exercised in plotting the inundation boundaries. However, because of the method, procedures, and assumptions used to develop the flooded areas, the limits of flooding shown and flood wave travel times are approximate and should be used only as a guideline for establishing evacuation zones. Actual areas inundated will depend on actual failure conditions and may differ from areas shown on the maps.

a. Northwest Valley -- The entire width of the northwest valley is expected to be flooded from the dam to Mile 13.0. The constriction at Mile 8.5 is expected to cause an increase in both the depth and velocity of flow.

The widening of the valley westwards in the vicinity of Tulare Hill and Coyote Creek continuing on a generally straight course would create an island around a low hill between Mile 12.0 and Mile 15.0. The flow would overtop the railroad at Mile 15.0 leaving a second low hill as another island on the west side of the valley.

At Mile 15.5, east of Coyote Creek, a trapezoidal concrete-lined channel connects Upper Silver Creek with Coyote Creek. The channel is expected to be surcharged by flow from Coyote Creek and cause flooding east of Coyote Creek and Bayshore Highway. Areas on both sides of Bayshore Highway are expected to be flooded as the highway is only slightly elevated and will therefore not obstruct the flow.

For the rest of the northwest valley, the area between Coyote Creek and Guadalupe River, the area east of Coyote Creek and the area west of Guadalupe River are expected to be inundated.

b. Southeast Valley -- The path of the expected flooding would follow the southeast valley all through the length of the routing reach. Highways and railroads are close to ground elevation and are therefore not expected to have a significant impact on flow directions. The valley widens suddenly in the vicinity of Mile 15.0 and contracts again at Mile 17.0 forming a pocket on the east side. This pocket would serve as storage. The narrowing of the valley at the Pajaro River prevents the routing of the flows to a point where the flows would not pose a threat to human life as defined by OES. Because the Pajaro River valley continues to be narrow all the way to the Pacific Ocean, the routing was stopped at Mile 18.3.

Conclusion

In the event of failure of Leroy Anderson Dam, both northwest and southeast portions of Santa Clara Valley would be inundated. The extent of flooding, actual flood elevations and times would depend on actual conditions at the time of failure. Based on OES guidelines, the flooding would be considered to pose no threat to human life at approximately 26.5 miles northwest of the dam. This location is approximately the boundary between City of Alviso and City of San Jose.

The point where the flows would not pose a threat to human life as defined by OES could not be attained in the southeast valley as the valley narrows suddenly at Pajaro River and continues that way to the Pacific Ocean.

REFERENCES

1. *Inundation Map of Anderson Dam*, S.C.C.F.C. & W.D., September 1973.

2. *Analysis of a Hypothetical Coyote Dam Failure and the Resulting Impact on Anderson Reservoir*, Santa Clara Valley Water District, February 1985.

3. *Leroy Anderson Dam and Spillway*, Santa Clara Valley Water District, August 1985.

4. Flood Hazard Maps of Santa Clara Valley, Santa Clara Valley Water District.

5. *San Francisco Bay Tidal Stage vs. Frequency Study*, U. S. Army Corps of Engineers, San Francisco District, October 1984.

6. *Sequence of Steps in Inundation Map Preparation*, OES, May 9, 1991.

7. *Notice of Revised Emergency Action Plan Guidelines*, Federal Energy Regulatory Commission, February 22, 1988.

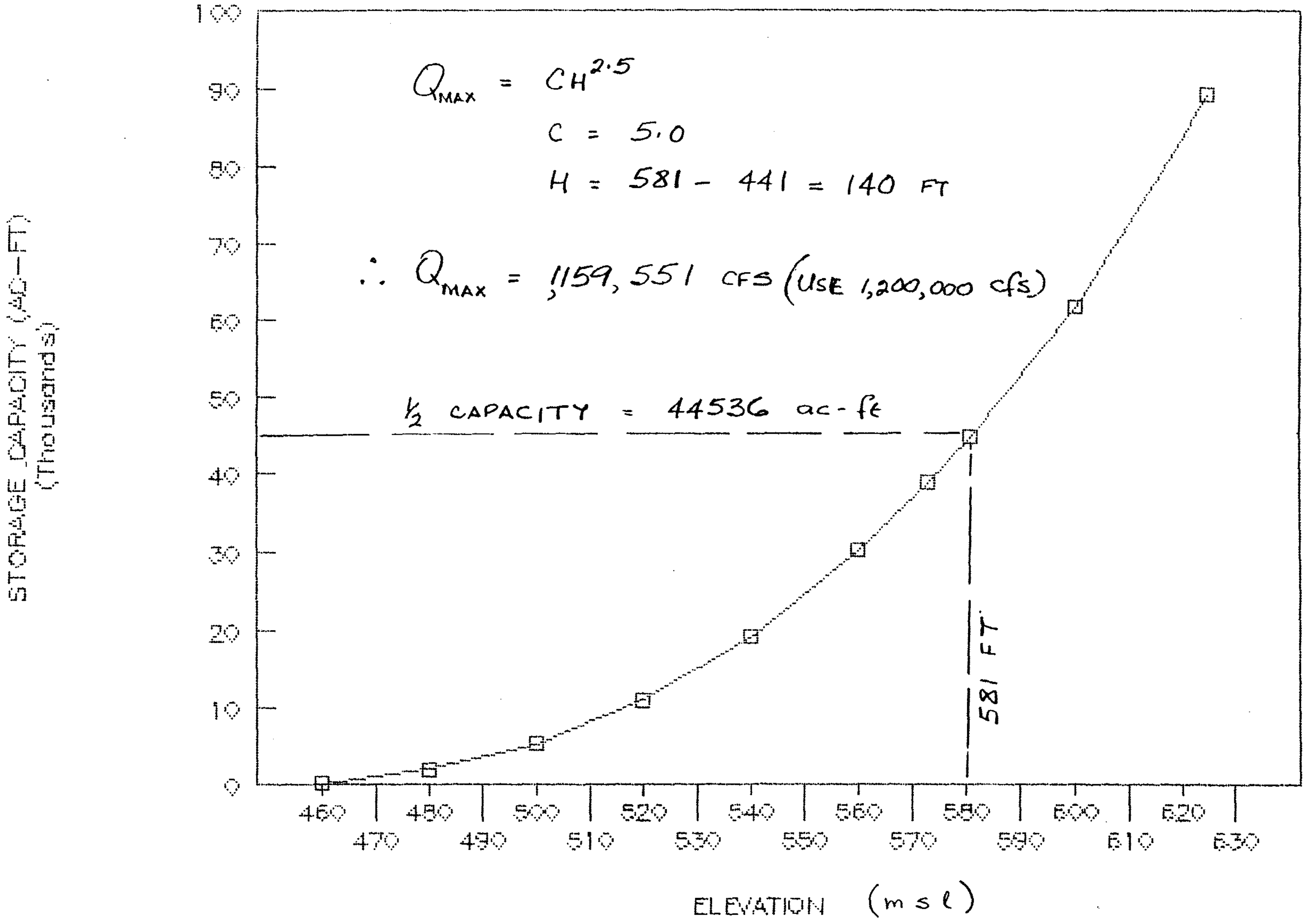
8. *Inspection and Safety Review - Leroy Anderson Dam*, Wahler Associates, August 1986

LEROY ANDERSON DAM INUNDATION STUDY

TABLE A-1: RESERVOIR ELEVATION-CAPACITY RELATIONSHIP

ELEVATION	CAPACITY (ac-ft)	
441	0	
460	222	
480	1984	
500	5334	
520	11013	
540	19166	
560	30120	
573	38787	
581	44536	1/2 CAPACITY
600	61459	
625	89073	

FIGURE A-1: STORAGE-ELEVATION RELATIONSHIP



$Q_{MAX} = CH^{2.5}$

$C = 5.0$

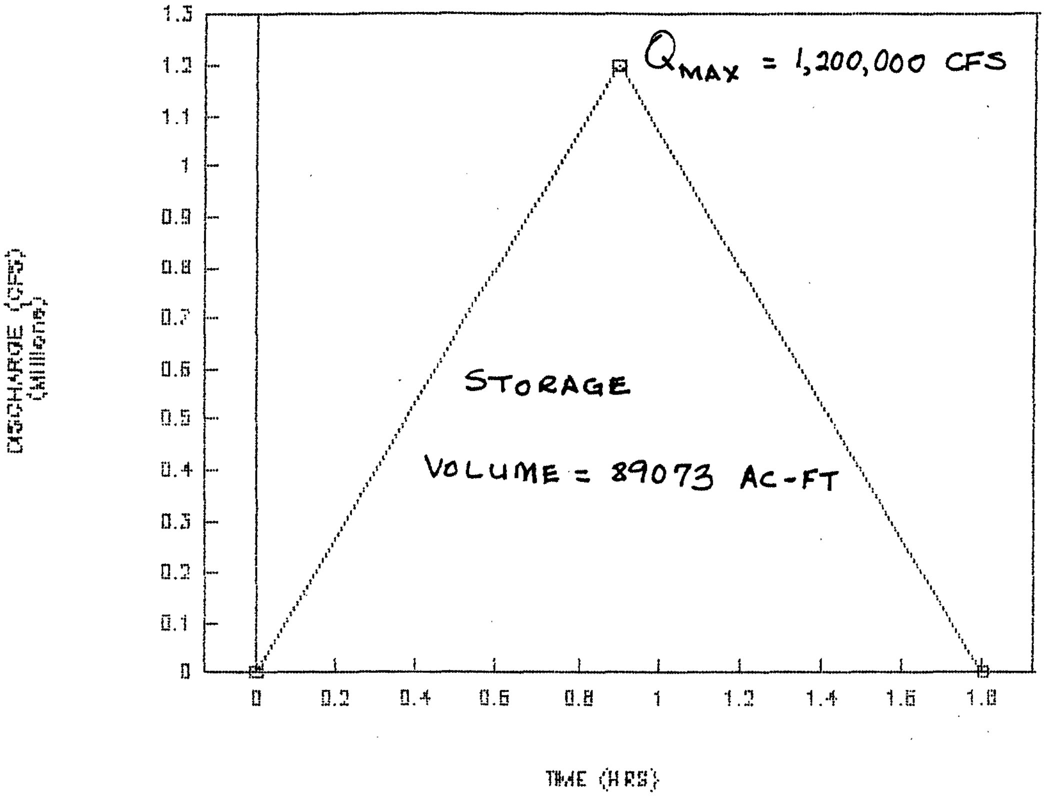
$H = 581 - 441 = 140$ FT

$\therefore Q_{MAX} = 1{,}159{,}551$ CFS (USE 1,200,000 cfs)

½ CAPACITY = 44536 ac-ft

581 FT

FIG A—2: HYDROGRAPH TIME BASE



ASSUMING AN ISOSCELES TRIANGLE

$A = \frac{1}{2} b h$

Where b = time base, t_b

$h = Q_{max}$ = 1,200,000 cfs

A = storage = (89073 ac-ft)(43560 ft^2/ac

$\therefore b = 1.8$ hr

Time base of hydrograph = 1.8 hr

LEROY ANDERSON DAM INUNDATION STUDY

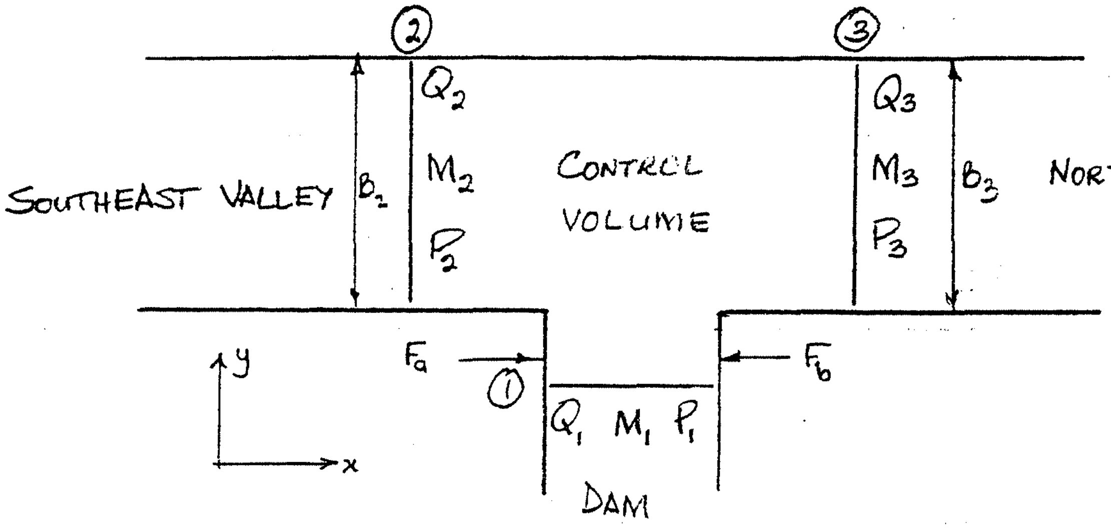
TABLE A-2: BREACH ANALYSIS USING NWS* BREACH MODEL
OUTPUT SUMMARY

```
QBP   MAX OUTFLOW(CFS) THRU BREACH                                     1182787.
TP    TIME(HR) AT WHICH PEAK OUTFLOW OCCURS                               2.67
QP    MAX TOTAL OUTFLOW(CFS) OCCURRING AT TIME TP                      1182787.
TRS   DURATION(HR) OF RISING LIMB OF HYDROGRAPH                            .03
TB    TIME(HR) AT WHICH SIGN. RISE IN OUTFLOW STARTS                      2.56
BRD   FINAL DEPTH(FT) OF BREACH                                         194.00
BRW   FINAL TOP WIDTH(FT) OF BREACH AT PEAK BREACH FLOW                 342.65
HU    ELEV(FT) OF TOP OF DAM                                            625.00
HY    FINAL ELEV(FT) OF RESERVOIR WATER SURFACE                         495.04
HC    FINAL ELEV(FT) OF BOTTOM OF BREACH                               431.000
AGL   ACUTE ANGLE THAT BREACH SIDE MAKES WITH VERTICAL AT QBP           41.032
QO    OUTFLOW (CFS) AT T=0.0                                             .3388
Z     SIDE SLOPE OF BREACH (FT/FT) AT PEAK BREACH FLOW                     .80
TFH   TIME OF FAILURE (HR) WHICH IS LINEAR EQUIVALENT OF TRS
      OBTAINED BY USING SIMPLIFIED DAM-BREAK DISCHARGE EQUATION           1.10
TFHI  TIME OF FAILURE (HR) WHICH IS LINEAR EQUIVALENT OF TRS
      OBTAINED BY INTEGRATING QB VS TIME FROM T=0 TO T=TP                  .01
BO    BOTTOM WIDTH (FT) OF BREACH AT PEAK BREACH FLOW                    31.25
```

*NWS = NATIONAL WEATHER SERVICE

APPENDIX B: SPLIT FLOW ANALYSIS

PROJECT LEROY ANDERSON DAM INUNDATION STUDY
FEATURE FLOW ROUTING BY BAT DATE 8/14/91
ITEM SPLIT FLOW ANALYSIS CHECKED J.B. DATE 8/14/91



Q_1 = TOTAL PEAK FLOW FROM RESERVOIR

M_1 = MOMENTUM OF FLOW FROM RESERVOIR ON CONTROL VOLUME

P_1 = FORCE ACTING ON CONTROL VOLUME BY FLOW FROM RESERVOIR

Q_2 = PEAK FLOW TRAVELING SOUTHEAST

M_2 = MOMENTUM OF Q_2 ACTING ON CONTROL VOLUME

P_2 = FORCE ACTING ON CONTROL VOLUME BY Q_2

Q_3 = PEAK FLOW TRAVELING NORTHWEST

M_3 = MOMENTUM OF Q_3 ACTING ON CONTROL VOLUME

P_3 = FORCE ACTING ON CONTROL VOLUME BY Q_3

F_a & F_b = FORCES ACTING ON CONTROL VOLUME BY CHANNEL WALLS

SHEET 2 OF

PROJECT LEROY ANDERSON DAM INUNDATION STUDY

FEATURE FLOW ROUTING BY BAT DATE 8/14/91

ITEM SPLIT FLOW ANALYSIS CHECKED J. B. DATE 8/14/91

USING THE CONSERVATION OF MOMENTUM PRINCIPLE

IN THE x - DIRECTION

$$M_{1x} + M_{2x} - M_{3x} + P_{1x} + P_{2x} - P_{3x} + F_{ax} - F_{bx} + WS_0 - \tau = 0$$

$M_{1x} = 0$ (No component in x-direction)

$M_2x = \frac{\rho Q_2^2}{B_2 y_2}$ WHERE

ρ = DENSITY OF WATER
B_2 = TOP WIDTH OF VALLEY AT BOUNDARY OF CONTROL VOLUME IN SOUTHEAST DIRECTION ②
y_2 = HYDRAULIC DEPTH AT ②

$M_{3x} = \frac{\rho Q_3^2}{B_3 y_3}$ WHERE

B_3 = TOP WITH AT BOUNDARY ③
y_3 = HYDRAULIC DEPTH AT ③

$P_{1x} = 0$ (No component in x-direction)

$P_{2x} = \frac{\gamma y_2^2 B_2}{2}$ WHERE γ = SPECIFIC WEIGHT OF WATER

$P_{3x} = \frac{\gamma y_3^2 B_2}{2}$

Assume $F_{ax} = F_{ay}$

AND $WS_0 = \tau$ WHERE

WS_0 = GRAVITATIONAL FORCE
τ = BOUNDARY SHEAR

SHEET ______ OF ______

PROJECT LEROY ANDERSON DAM INUNDATION STUDY

FEATURE FLOW ROUTING BY BAT DATE 8/14/91

ITEM SPLIT FLOW ANALYSIS CHECKED J.B. DATE 8/14/91

$$M_{2x} - M_{3x} + P_{2x} - P_{3x} = 0$$

$$\frac{\rho Q_2^2}{B_2 y_2} - \frac{\rho Q_3^2}{B_3 y_3} + \frac{\gamma y_2^2 B_2}{2} - \frac{\gamma y_3^2 B_3}{2} = 0$$

$$\frac{\rho Q_2^2}{B_2 y_2} + \frac{\gamma y_2^2 B_2}{2} = \frac{\rho Q_3^2}{B_3 y_3} + \frac{\gamma y_3^2 B_3}{2}$$

Since $\gamma = \rho g$

and $B_2 y_2 = A_2$

and $B_3 y_3 = A_3$

$$\frac{\cancel{\rho} Q_2^2}{A_2} + \frac{\cancel{\rho g} y_2 A_2}{2} = \frac{\cancel{\rho} Q_3^2}{A_3} + \frac{\cancel{\rho g} y_3 A_3}{2}$$

Let $Q_3 = C - Q_2$ where $c = 1200000$ cfs

$$\frac{Q_2^2}{A_2} + \frac{g y_2 A_2}{A_2} = \frac{(C - Q_2)^2}{A_3} + \frac{g y_3 A_3}{2}$$

or

$$\boxed{M_2 + F_2 = M_3 + F_3}$$

Plot Q vs F + M for each side

LEROY ANDERSON DAM INUNDATION STUDY
TABLE B-1: HYDRAUULIC PARAMETERS FOR NORTHWEST VALLEY CROSS SECTION 0.5

Q3	A3	B3	Y3	F3+M3
10000	5106	2046	2.50	224740
50395	11462	3066	3.74	911453
90790	19194	3967	4.84	1924632
171580	31551	4361	7.23	4608156
257370	41905	4592	9.13	7737511
343160	51633	4800	10.76	11222785
428951	61829	5008	12.35	15265767
514741	71173	5342	13.32	18989695
600531	81026	5818	13.93	22618628
686321	91195	6273	14.54	26509984
772111	100876	6676	15.11	30450389
857902	110435	7052	15.66	34508222
943692	119614	7395	16.17	38594783
1029482	128569	7715	16.66	42738805
1115272	136907	7928	17.27	47149153
1201063	144726	8094	17.88	51630976
1286853	152070	8246	18.44	56040896
1372643	159081	8390	18.96	60406403
1458438	165860	8526	19.45	64771725
1544224	172507	8657	19.93	69167541

Q3 = SPLIT FLOW TRAVELLING NORTHWEST
A3 = CROSS SECTION AREA
B3 = CROSS SECTION TOP WIDTH
Y3 = HYDRAULIC DEPTH = A3/B3
F3+M3 = FORCE AND MOMENTUM ACTING ON CONTROL VOLUME

LEROY ANDERSON DAM INUNDATION STUDY

TABLE B-2: HYDRAULIC PARAMETERS FOR SOUTHEAST VALLEY

CROSS SECTION 0.5

Q2	A2	B2	Y2	F2+M2
10000	12325	4308	2.86	575820
50395	18757	4494	4.17	1395767
90790	25188	4680	5.38	2509818
171580	41651	5117	8.14	6165168
257370	52725	5391	9.78	9558451
343160	64195	5745	11.17	13383229
428951	76870	6171	12.46	17810078
514741	89410	6565	13.62	22568249
600531	101027	6909	14.62	27353752
686321	113033	7249	15.59	32543712
772111	124464	7578	16.42	37702123
857902	136300	7989	17.06	42838903
943692	148361	8386	17.69	48260773
1029482	160297	8762	18.29	53825969
1115272	171990	9115	18.87	59480713
1201063	183421	9448	19.41	65194992
1286853	194272	9749	19.93	70855716
1372643	205123	10049	20.41	76596611
1458438	215359	10317	20.88	82256572
1544224	225594	10584	21.31	87986512

Q2 = SPLIT FLOW TRAVELING SOUTHEAST
A2 = CROSS SECTION AREA
B2 = CROSS SECTION TOP WIDTH
Y2 = HYDRAULIC DEPTH =A2/B2
F2+M2 = FORCE AND MOMENTUM ACTING ON CONTROL VOLUME

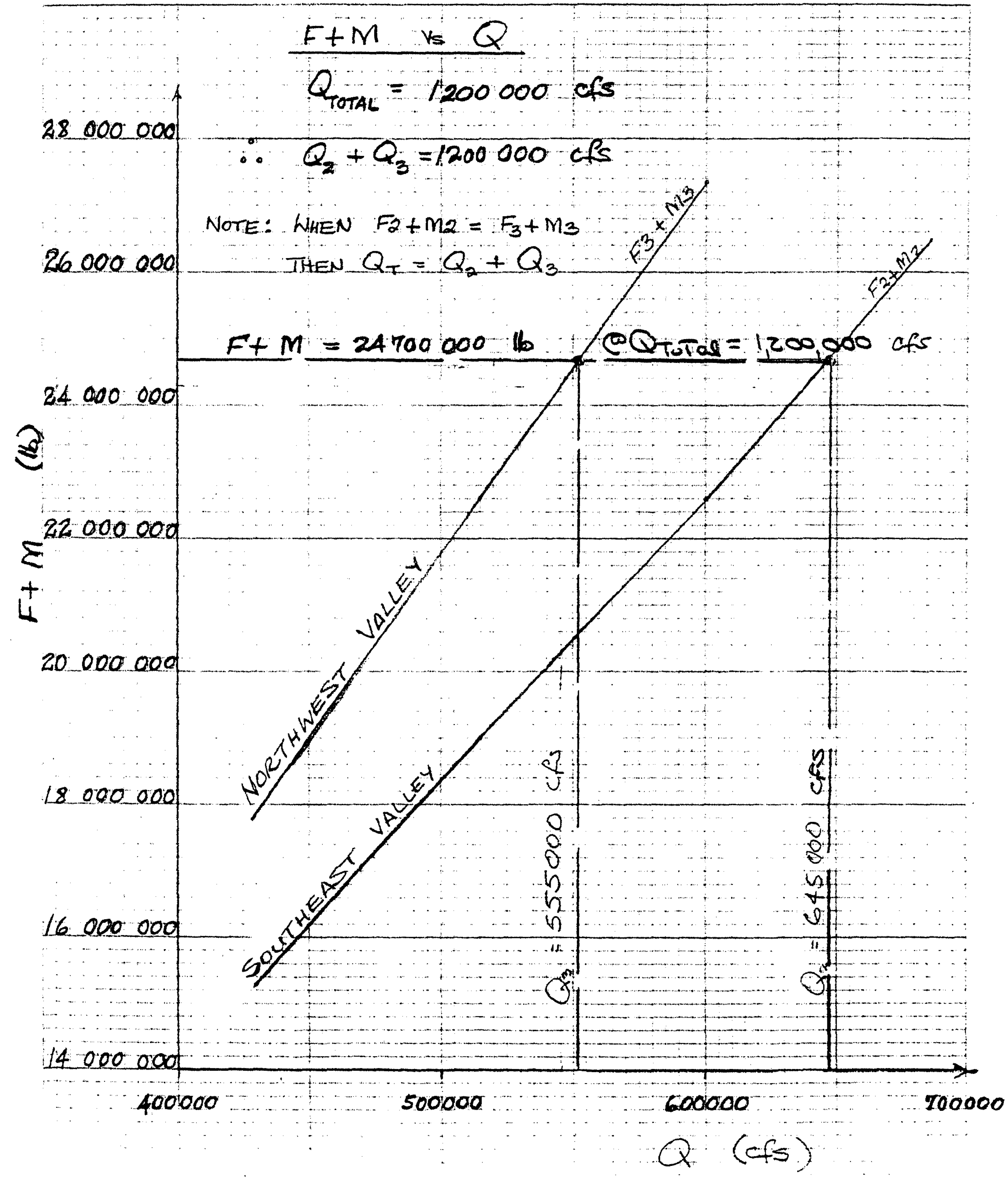
ENSIGN & BUCKLEY
CONSULTING ENGINEERS
• SACRAMENTO •

SHEET 6 OF

PROJECT LEROY ANDERSON DAM

FEATURE SPLIT FLOW BY BAT DATE 8/13/91

ITEM MOMENTUM ANALYSIS CHECKED J.B. DATE 8/14/91



F+M vs Q

$Q_{TOTAL} = 1200000$ cfs

$\therefore Q_2 + Q_3 = 1200000$ cfs

NOTE: WHEN $F2 + M2 = F3 + M3$
THEN $Q_T = Q_2 + Q_3$

$F + M = 24700000$ lb @ $Q_{TOTAL} = 1{,}200{,}000$ cfs

$Q_3 = 555000$ cfs

$Q_2 = 645000$ cfs

FIGURE 1

ENSIGN & BUCKLEY
CONSULTING ENGINEERS
• SACRAMENTO •

SHEET ______ OF ______

PROJECT LEROY ANDERSON DAM INUNDATION STUDY

FEATURE FLOW ROUTING BY BAT DATE 8/14/91

ITEM SPLIT FLOW ANALYSIS CHECKED J.B DATE 8/14/91

FROM Q vs. F+M CURVES

Q_2 = 645 000 cfs

Q_3 = 555 000 cfs

Q_{TOTAL} = 1200 000 cfs

Increase Q_2 and Q_3 by 10% to compensate for uncertainties

$Q_2 + 10\% Q_2$ = 709,500 cfs

Use 710,000 cfs for southeast valley

$Q_3 + 10\% Q_3$ = 610,500 cfs

Use 611 000 cfs for northwest valley

APPENDIX C1: DAMBRK RUN SUMMARY FOR NORTHWEST VALLEY

LEROY ANDERSON DAM INUNDATION STUDY

TABLE C-1: DAMBRK RUN SUMMARY FOR NORTHWEST VALLEY BELOW LEROY ANDERSON DAM

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	DEPTH X VEL	TIME OF FLOOD* WAVE ARRIVAL HRS	MAXIMUM FLOODING DEPTH FEET	SHEET NO
0.5	379.73	594000	2.18	5.11	360.00	101	0.00	19.73	4
1.0	376.99	547853	2.23	5.59	360.00	95	0.05	16.99	4
1.5	373.14	518833	2.28	5.86	350.00	136	0.10	23.14	4
2.0	365.81	504180	2.38	7.33	350.00	116	0.20	15.81	4
2.5	353.69	496208	2.43	7.96	340.00	109	0.25	13.69	4
3.0	341.77	488646	2.53	7.84	326.67	118	0.35	15.10	4
3.5	329.83	483088	2.58	7.98	313.33	132	0.40	16.50	4
4.0	319.67	473151	2.68	6.89	300.00	136	0.50	19.67	4
4.5	310.22	462463	2.78	7.43	290.83	144	0.60	19.39	4
5.0	300.19	454652	2.88	7.85	281.67	145	0.70	18.52	4
5.5	289.99	448854	2.98	8.12	272.50	142	0.800	17.49	4
6.0	280.53	444899	2.98	7.74	263.33	133	0.800	17.20	4
6.5	271.30	437598	3.38	8.16	254.17	140	1.20	17.13	4
7.0	269.84	391660	3.48	5.25	245.00	130	1.30	24.84	4
7.5	268.77	334780	3.53	5.78	243.33	147	1.35	25.44	4
8.0	266.91	315663	3.58	5.97	241.67	151	1.40	25.24	4
8.5	262.12	310710	3.68	10.02	240.00	222	1.50	22.12	4
9.0	254.33	306043	3.63	10.36	230.71	245	1.65	23.62	4
9.5	247.33	299700	3.98	10.84	221.43	281	1.80	25.90	4
10.0	240.56	273925	4.08	11.47	212.14	326	1.90	28.42	4
10.5	231.49	260552	4.28	12.07	202.86	346	2.10	28.63	4
11.0	220.74	248477	4.53	12.76	193.57	347	2.35	27.17	3
11.5	206.70	243701	4.53	8.15	184.29	183	2.35	22.41	3
12.0	195.93	232656	4.98	5.47	175.00	114	2.80	20.93	3
12.5	189.53	214743	5.33	5.03	170.00	98	3.15	19.53	3
13.0	181.61	208062	5.53	5.42	165.00	90	3.35	16.61	3
13.5	171.72	202080	5.98	7.70	161.00	83	3.80	10.72	3
14.0	167.42	195504	5.98	3.58	155.00	44	3.81	12.42	3
14.5	163.77	193898	6.58	6.62	150.00	91	4.40	13.77	3
15.0	162.19	169391	6.68	8.48	150.00	103	4.50	12.19	3
15.5	158.07	169934	6.58	11.15	150.00	90	4.40	8.07	3
16.0	140.08	169695	6.93	6.42	135.00	33	4.75	5.08	3
16.5	131.57	167624	7.08	4.26	121.75	42	4.90	9.82	3
17.0	124.03	165382	7.33	3.86	108.50	60	5.15	15.53	3
17.5	117.29	163558	7.48	3.32	104.00	44	5.30	13.29	3
18.0	110.43	161871	7.73	3.17	102.00	27	5.55	8.43	3
18.1	108.96	161571	7.73	3.20	101.00	25	5.55	7.96	3
18.2	107.50	161318	7.78	3.24	100.00	24	5.60	7.50	3
18.3	106.04	161053	7.83	3.28	99.00	23	5.65	7.04	3
18.4	104.59	160771	7.88	3.32	98.00	22	5.70	6.59	3
18.5	103.14	160471	7.93	3.36	97.00	21	5.75	6.14	3
18.6	101.69	160153	7.98	3.41	96.00	19	5.80	5.69	3
18.7	100.25	159858	7.98	3.46	95.00	18	5.80	5.25	3
18.8	98.82	159568	8.03	3.50	94.00	17	5.85	4.82	3
18.9	97.40	159255	8.08	3.56	93.00	16	5.90	4.40	3
19.0	95.98	158917	8.13	3.61	92.00	14	5.95	3.98	3

* NOTE: TIME OF FLOOD WAVE ARRIVAL CALCULATED MANUALLY AS FOLLOWS:-
TIME OF FLOOD WAVE ARRIVAL = TIME MAX ELEV @ SECTION - TIME MAX ELEV @ SECTION 0.5

LEROY ANDERSON DAM INUNDATION STUDY

TABLE C-1: DAMBRK RUN SUMMARY FOR NORTHWEST VALLEY BELOW LEROY ANDERSON DAM

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	DEPTH X VEL	TIME OF FLOOD* WAVE ARRIVAL HRS	MAXIMUM FLOODING DEPTH FEET	SHEET NO
19.0	95.98	158917	8.13	3.61	92.00	14	5.95	3.98	3
19.1	94.58	158552	8.18	3.67	90.30	16	6.00	4.28	3
19.2	93.19	158203	8.23	3.73	88.60	17	6.05	4.59	3
19.3	91.81	157852	8.28	3.79	86.90	19	6.10	4.91	3
19.4	90.44	157481	8.28	3.86	85.20	20	6.10	5.24	3
19.5	89.10	157099	8.33	3.94	83.50	22	6.15	5.60	3
19.6	87.76	156719	8.38	4.03	81.80	24	6.20	5.96	3
19.7	86.41	156399	8.43	4.12	80.10	26	6.25	6.31	3
19.8	85.04	156142	8.43	4.24	78.40	28	6.25	6.64	3
19.9	83.58	155925	8.48	4.43	76.70	30	6.30	6.88	2
20.0	81.93	155721	8.48	4.83	75.00	33	6.30	6.93	2
20.5	73.95	155017	8.63	4.36	66.25	34	6.45	7.70	2
21.0	66.71	154161	8.78	3.93	57.50	36	6.60	9.21	2
21.5	59.61	153329	8.88	3.71	55.00	17	6.70	4.61	2
22.0	53.02	152081	9.13	3.33	48.00	17	6.95	5.02	2
22.5	46.86	150490	9.28	3.22	40.00	22	7.10	6.86	2
23.0	40.83	148307	9.58	3.04	31.00	30	7.40	9.83	2
23.5	34.28	146952	9.73	3.16	26.50	25	7.55	7.78	2
24.0	29.00	143715	10.13	2.52	22.00	18	7.95	7.00	2
24.5	25.16	139327	10.48	2.43	19.67	13	8.30	5.49	2
25.0	21.43	135462	10.83	3.83	17.33	16	8.65	4.10	2
25.5	17.54	131791	11.18	5.46	15.00	14	9.00	2.54	2
26.0	13.79	127791	11.58	2.63	11.25	7	9.40	2.54	2
26.5	10.52	124529	11.98	2.01	7.50	6	9.80	3.02	2
27.0	8.05	121034	12.28	1.64	3.75	7	10.10	4.30	2
27.5	4.00	120953	12.68	2.40	0.00	10	10.51	4.00	2

* NOTE: TIME OF FLOOD WAVE ARRIVAL CALCULATED MANUALLY AS FOLLOWS:-
TIME OF FLOOD WAVE ARRIVAL = TIME MAX ELEV @ SECTION - TIME MAX ELEV @ SECTION 0.5

APPENDIX C2: DAMBRK RUN SUMMARY FOR SOUTHEAST VALLEY

LEROY ANDERSON DAM INUNDATION STUDY

TABLE C-2: DAMBRK RUN SUMMARY FOR SOUTHEAST VALLEY BELOW LEROY ANDERSON DAM

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	TIME OF FLOOD* WAVE ARRIVAL HRS	DEPTH X VEL	MAXIMUM FLOODING DEPTH FEET	SHEET NO
0.50	375.56	709999	2.15	6.92	350.00	0.00	176.9	25.56	5
1.00	370.63	661698	2.20	6.50	346.00	0.05	160.1	24.63	5
1.50	365.41	619700	2.30	6.13	342.00	0.15	143.5	23.41	5
2.00	359.99	587294	2.40	5.76	338.00	0.25	126.7	21.99	5
2.50	354.32	561342	2.50	5.45	334.00	0.35	110.7	20.32	5
3.00	347.38	544109	2.60	5.97	330.00	0.45	103.8	17.38	5
3.50	338.26	531431	2.70	6.32	321.25	0.55	107.5	17.01	5
4.00	329.08	521261	2.80	6.54	312.50	0.65	108.4	16.58	5
4.50	320.05	513604	2.85	6.59	303.75	0.70	107.4	16.30	5
5.00	311.12	506009	2.95	6.62	295.00	0.80	106.7	16.12	5
5.50	301.80	495831	3.05	7.13	288.00	0.90	98.4	13.80	5
6.00	291.20	485305	3.20	6.71	278.50	1.05	85.2	12.70	5
6.50	280.74	473269	3.30	6.44	269.00	1.15	75.6	11.74	5
7.00	270.37	461812	3.40	6.16	259.50	1.25	67.0	10.87	5
7.50	260.40	450239	3.55	5.70	250.00	1.40	59.3	10.40	5
8.00	251.60	433559	3.65	5.42	242.00	1.50	52.0	9.60	5
8.50	242.91	419923	3.80	5.18	234.00	1.65	46.2	8.91	5
9.00	234.32	408198	3.95	4.95	226.00	1.80	41.2	8.32	5
9.50	225.82	397994	4.10	4.75	218.00	1.95	37.1	7.82	5
10.00	217.81	385839	4.30	4.36	210.00	2.15	34.1	7.81	6
10.50	211.08	372198	4.45	4.35	202.75	2.30	36.2	8.33	6
11.00	204.56	358826	4.65	4.32	195.50	2.50	39.1	9.06	6
11.50	198.20	349180	4.80	4.25	188.25	2.65	42.3	9.95	6
12.00	192.24	339351	4.95	4.24	181.00	2.80	47.7	11.24	6
12.50	186.61	329762	5.10	4.12	173.25	2.95	55.0	13.36	6
13.00	181.02	320322	5.30	4.01	165.50	3.15	62.2	15.52	6
13.50	175.44	309306	5.45	4.20	157.75	3.30	74.3	17.69	6
14.00	170.22	295150	5.70	5.00	150.00	3.55	101.1	20.22	6
14.50	165.65	279591	5.95	4.29	147.14	3.80	79.4	18.51	6
15.00	161.07	266194	6.15	4.21	144.29	4.00	70.6	16.78	6
15.50	156.47	255817	6.40	4.20	141.43	4.25	63.2	15.04	6
16.00	154.49	247058	10.95	4.22	138.57	4.30	67.2	15.92	6
16.50	154.49	237274	10.90	4.18	135.71	4.36	78.5	18.78	6
17.00	154.49	196900	10.90	3.71	132.86	4.41	80.2	21.63	6
17.50	154.48	114794	10.89	1.51	130.00	4.46	37.0	24.48	6
18.03	154.49	122773	10.85	1.08	130.00	4.51	26.4	24.49	6
18.30	154.51	113902	11.05	8.98	130.00	4.54	220.1	24.51	6

* NOTE: TIME OF FLOOD WAVE ARRIVAL CALCULATED MANUALLY AS FOLLOWS:-
TIME OF FLOOD WAVE ARRIVAL = TIME MAX ELEV @ SECTION - TIME MAX ELEV @ SECTION 0.5

EMERGENCY MANAGER'S ASSOCIATION
# of SANTA CLARA COUNTY

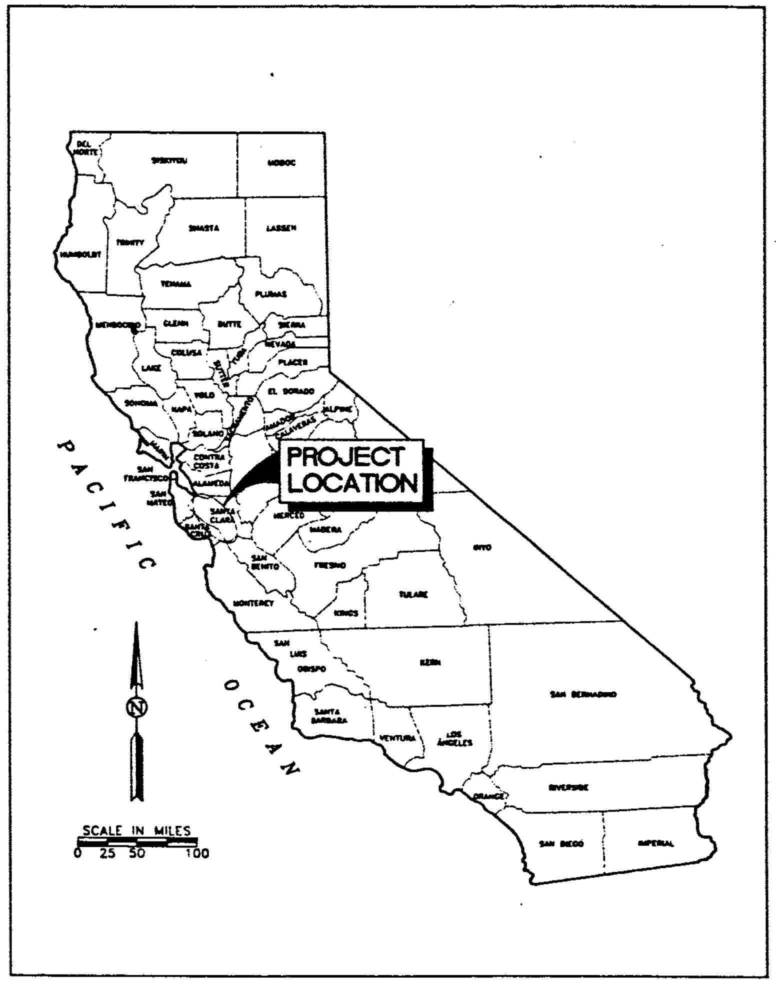
10	**LOS ALTOS**	Fire Chief Richard Landrum Los Altos Fire Dept. 10 Almond Avenue Los Altos, CA 94022	**Work Tel** 415 948-2404 **Pri. FAX** 415 948-0851 **Alt. FAX** **Home Tel**
11	**LOS ALTOS**	Ron Prioste Los Altos Fire Dept. 10 Almond Avenue Los Altos, CA 94022	**Work Tel** 415 948-2404 **Pri. FAX** 415 948-0851 **Alt. FAX** **Home Tel**
12	**LOS ALTOS HILLS**	Les Jones City Manager Los Altos Hills 26379 Fremont Road Los Altos Hills, CA 94022	**Work Tel** 415 941-7222 **Pri. FAX** 415 941-3160 **Alt. FAX** **Home Tel**
13	**LOS GATOS**	Captain Art Roy Los Gatos Police Dpt 110 East Main Street Los Gatos, CA 95032	**Work Tel** 408 354-6847 **Pri. FAX** 408 354-8431 **Alt. FAX** **Home Tel**
(	**MILPITAS**	Cecil Williams Milpitas Fire Dept. 25 W. Curtis Avenue Milpitas, CA 95035	**Work Tel** 408 942-2383 **Pri. FAX** 408 263-7836 **Alt. FAX** **Home Tel**
15	**MONTE SERENO**	Rosemary Pierce Administrator City of Monte Sereno 18041 Saratoga / Los Gatos Road Monte Sereno, CA 95030	**Work Tel** 408 354-7635 **Pri. FAX** 408 395-7653 **Alt. FAX** **Home Tel**
16	**MORGAN HILL**	Sharon Kohlmannslehner Emergency Svcs Coord Morgan Hill Fire Dpt 18980 Monterey Road Morgan Hill, CA 95037	**Work Tel** 408 776-7351 **Pri. FAX** 408 778-6376 **Alt. FAX** **Home Tel**
17	**MOUNTAIN VIEW**	Captain John Fetz Mountain View OES 1000 Villa Street Mountain View, CA 94041	**Work Tel** 415 903-6365 **Pri. FAX** 415 903-6122 **Alt. FAX** **Home Tel** 408 985-7716
18	**PALO ALTO**	Captain Keith Ramsey Palo Alto Fire Dept. 250 Hamilton Avenue Palo Alto, CA 94301	**Work Tel** 415 329-2424 **Pri. FAX** 415 329-2299 **Alt. FAX** **Home Tel**

SANTA CLARA VALLEY WATER DISTRICT

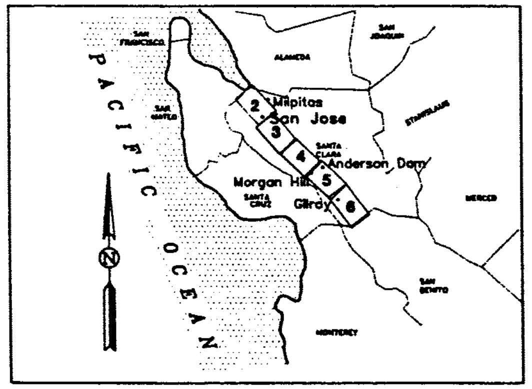
LEROY ANDERSON DAM INUNDATION STUDY

1991

***Prepared By:** Ensign & Buckley Consulting Engineers*



PROJECT LOCATION MAP



AREA OF SHEET COVERAGE

PROFILE OF CRESTS AND TIMES FOR SOUTHEAST VALLEY BELOW LEROY ANDERSON DAM

DISTANCE FROM DAM – MILES	MAX. ELEV. FEET	MAX. FLOW CFS	TIME OF MAX. ELEV–HRS	MAX. VEL FPS	FLOOD ELEV. FEET	TIME OF WAVE ARRIVAL–HRS	DEPTH X VEL.	MAXIMUM DEPTH–FT	SHEET NO.
0.5	375.56	709,999	2 HRS. 09 MIN.	6.92	350.00	0 HR. 0 MIN.	176.88	25.56	5
2.0	359.99	587,294	2 HR. 24 MIN.	5.76	338.00	0 HR. 15 MIN.	126.66	21.99	5
4.0	329.08	521,261	2 HR. 48 MIN.	6.54	312.50	0 HR. 39 MIN.	108.43	16.58	5
5.0	311.12	506,009	2 HR. 57 MIN.	6.62	295.00	0 HR. 48 MIN.	106.71	16.12	5
6.0	291.20	485,305	3 HR. 12 MIN.	6.71	278.50	1 HR. 03 MIN.	85.22	12.70	5
8.0	251.60	433,559	3 HR. 39 MIN.	5.42	242.00	1 HR. 30 MIN.	52.03	19.60	5
10.0	217.81	385,839	4 HR. 18 MIN.	4.36	210.00	2 HR. 09 MIN.	34.05	7.81	6
12.0	192.24	339,351	4 HR. 57 MIN.	4.24	181.00	2 HR. 48 MIN.	47.66	11.24	6
14.0	170.22	295,150	5 HR. 42 MIN.	5.00	150.00	3 HR. 33 MIN.	101.10	20.22	6
16.0	154.49	247,058	10 HR. 57 MIN.	4.22	138.57	4 HR. 45 MIN.	67.18	15.92	6
18.0	154.49	122,773	10 HR. 51 MIN.	1.08	130.00	4 HR. 48 MIN.	26.45	24.49	6
18.3	154.51	113,902	11 HR. 03 MIN.	8.98	130.00	4 HR. 54 MIN.	220.10	24.51	6

PROFILE OF CRESTS AND TIMES FOR NORTHWEST VALLEY BELOW LEROY ANDERSON DAM

DISTANCE FROM DAM – MILES	MAX. ELEV. FEET	MAX. FLOW CFS	TIME OF MAX. ELEV–HRS	MAX. VEL. FPS	FLOOD ELEV. FEET	TIME OF WAVE ARRIVAL–HRS	DEPTH X VEL.	MAXIMUM DEPTH–FT	SHEET NO.
0.5	379.73	594,000	2 HR. 11 MIN.	5.11	360.00	0 HR. 0 MIN.	100.82	19.73	4
2.0	365.81	504,180	2 HR. 23 MIN.	7.33	350.00	0 HR. 12 MIN.	115.89	15.81	4
4.0	319.67	473,151	2 HR. 41 MIN.	6.89	300.00	0 HR. 30 MIN.	135.53	19.67	4
6.0	280.53	444,899	2 HR. 59 MIN.	7.74	263.33	0 HR. 48 MIN.	133.13	17.20	4
7.0	269.84	391,660	3 HR. 29 MIN.	5.25	245.00	1 HR. 18 MIN.	130.41	24.84	4
8.0	266.91	315,663	3 HR. 35 MIN.	5.97	241.67	1 HR. 24 MIN.	150.68	25.24	4
8.5	262.12	310,710	3 HR. 41 MIN.	10.02	240.00	1 HR. 30 MIN.	221.64	22.12	4
9.0	254.33	306,043	3 HR. 50 MIN.	10.36	230.71	1 HR. 39 MIN.	244.70	23.62	4
10.0	240.56	273,925	4 HR. 05 MIN.	11.47	212.14	1 HR. 54 MIN.	325.98	28.42	3
12.0	195.93	232,656	4 HR. 59 MIN.	5.47	175.00	2 HR. 48 MIN.	114.49	20.93	3
14.0	167.42	195,504	5 HR. 59 MIN.	3.58	155.00	3 HR. 49 MIN.	44.46	12.42	3
16.0	140.08	169,695	6 HR. 56 MIN.	6.42	135.00	4 HR. 45 MIN.	32.61	5.08	3
18.0	110.43	161,871	7 HR. 44 MIN.	3.17	102.00	5 HR. 33 MIN.	27.00	8.43	4
20.0	81.93	155,721	8 HR. 29 MIN.	4.83	75.00	6 HR. 18 MIN.	33.47	6.93	2
22.0	53.02	152,081	9 HR. 08 MIN.	3.33	48.00	6 HR. 57 MIN.	16.71	5.02	2
24.0	29.00	143,715	10 HR. 08 MIN.	2.52	22.00	7 HR. 57 MIN.	17.64	7.00	2
26.0	13.79	127,791	11 HR. 35 MIN.	2.63	11.25	9 HR. 24 MIN.	6.68	2.54	2
26.5	10.52	124,529	11 HR. 59 MIN.	2.01	7.50	9 HR. 48 MIN.	6.07	3.02	2
27.5	4.00	120,953	12 HR. 41 MIN.	2.40	0.00	10 HR. 30 MIN.	9.80	4.00	2

NOTES:

1. *Users of these maps are being advised that because of the method, procedures, and assumptions used to develop the flooded areas, the limits of flooding shown and flood wave travel times are approximate and should be used only as a guideline for establishing evacuation zones. Actual areas inundated will depend on actual failure conditions and may differ from areas shown on the maps.*

REVISIONS
BY DATE

OWNER
NAME: SANTA CLARA VALLEY WATER DISTRICT
ADDRESS
5750 ALAMADEN EXPRESSWAY
SAN JOSE, CA. 95118
DATE:

ENGINEERING ANALYSIS BY
NAME: ENSIGN & BUCKLEY CONSULTING ENGINEERS
ADDRESS 3327 LONGVIEW DRIVE
NORTH HIGHLANDS, CA. 95660
SIGNATURE:
REG. CIV. ENG. NO.

SANTA CLARA COUNTY
DWR. REGISTRY NO.
ACCEPTED BY:
REG. CIV. ENG. NO.

INUNDATION MAP
OF
ANDERSON DAM
SHEET NO. 1 OF 6
DRAWING NO.

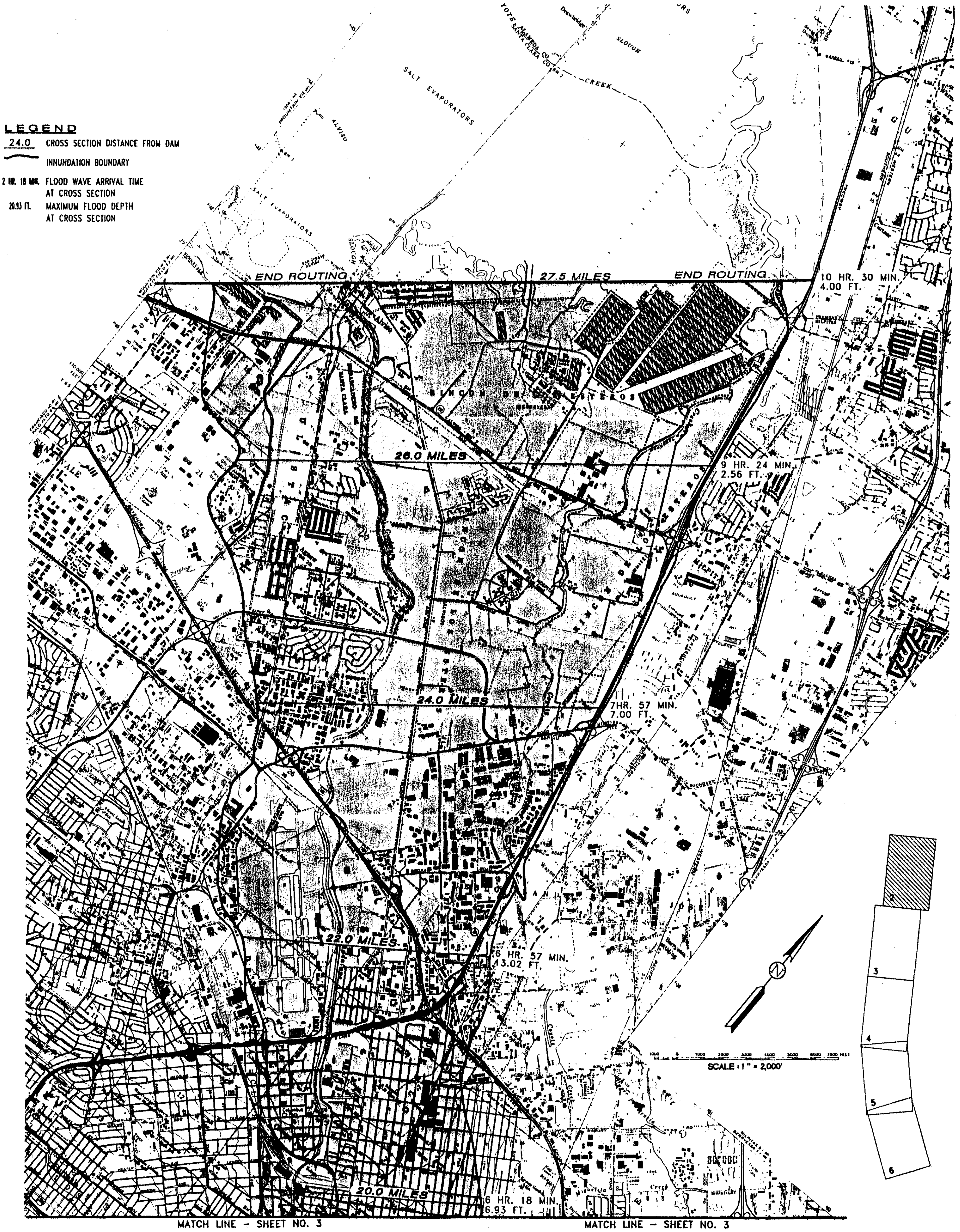
LEGEND

24.0 CROSS SECTION DISTANCE FROM DAM

INNUNDATION BOUNDARY

2 HR. 18 MIN. FLOOD WAVE ARRIVAL TIME AT CROSS SECTION

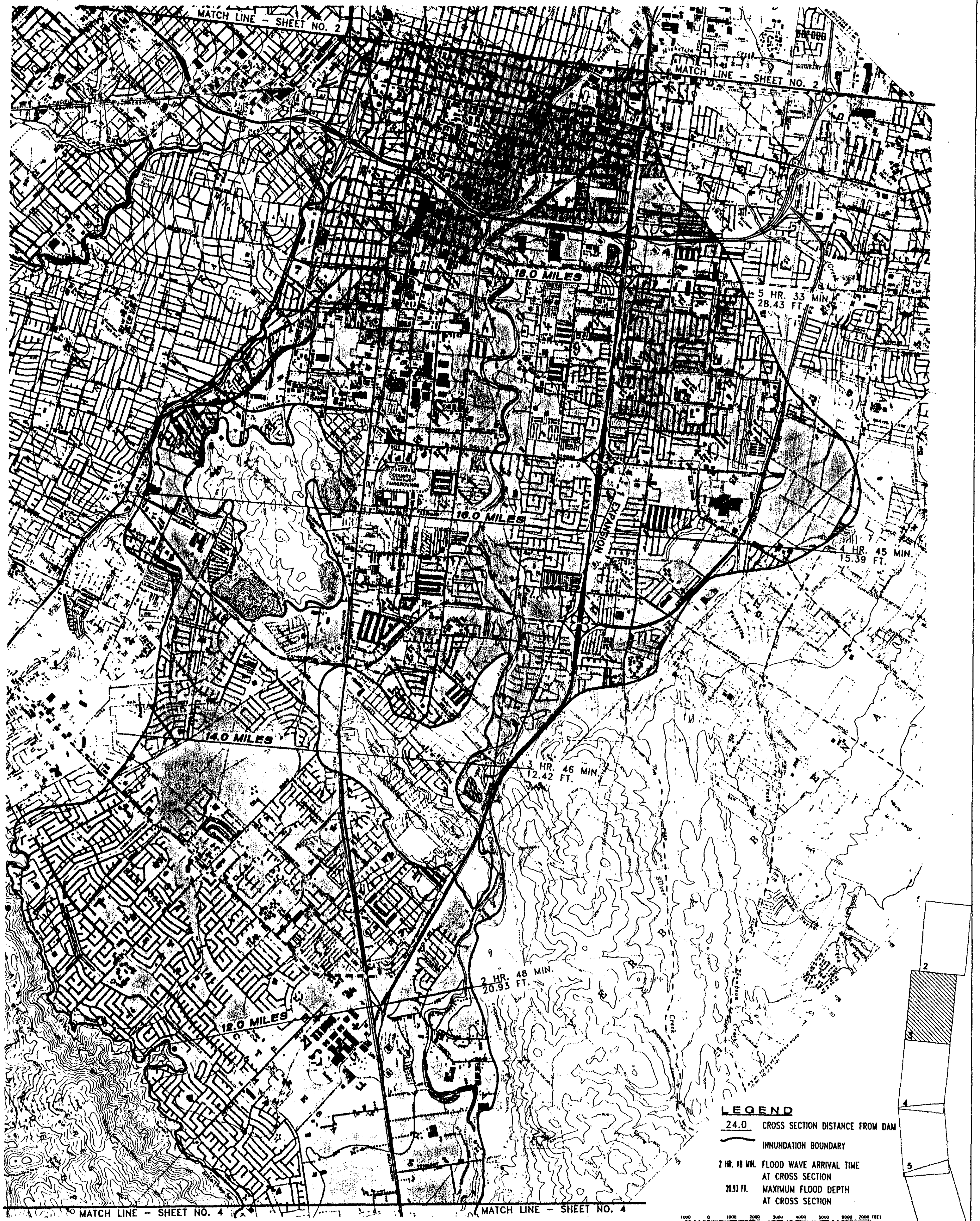
20.93 FT. MAXIMUM FLOOD DEPTH AT CROSS SECTION



MATCH LINE – SHEET NO. 3 MATCH LINE – SHEET NO. 3

SOURCE MAP: MILPITAS 7.5' QUADRANGLE

REVISIONS		OWNER	ENGINEERING ANALYSIS BY		
BY	DATE	NAME: SANTA CLARA VALLEY WATER DISTRICT ADDRESS: 5750 ALAMADEN EXPRESSWAY SAN JOSE, CA. 95118 DATE: SEPT. 27, 1991	NAME: ENSIGN & BUCKLEY CONSULTING ENGINEERS ADDRESS: 3327 LONGVIEW DRIVE NORTH HIGHLANDS, CA. 95660 SIGNATURE: JOHN J. BUCKLEY John J. Buckley REG. CIV. ENG. NO. 16822	SANTA CLARA COUNTY DWR REGISTRY NO. ACCEPTED BY: REG. CIV. ENG. NO.	INUNDATION MAP OF ANDERSON DAM SHEET NO. 2 OF 6 DRAWING NO.



LEGEND

24.0 CROSS SECTION DISTANCE FROM DAM

INNUNDATION BOUNDARY

2 HR. 18 MIN. FLOOD WAVE ARRIVAL TIME AT CROSS SECTION

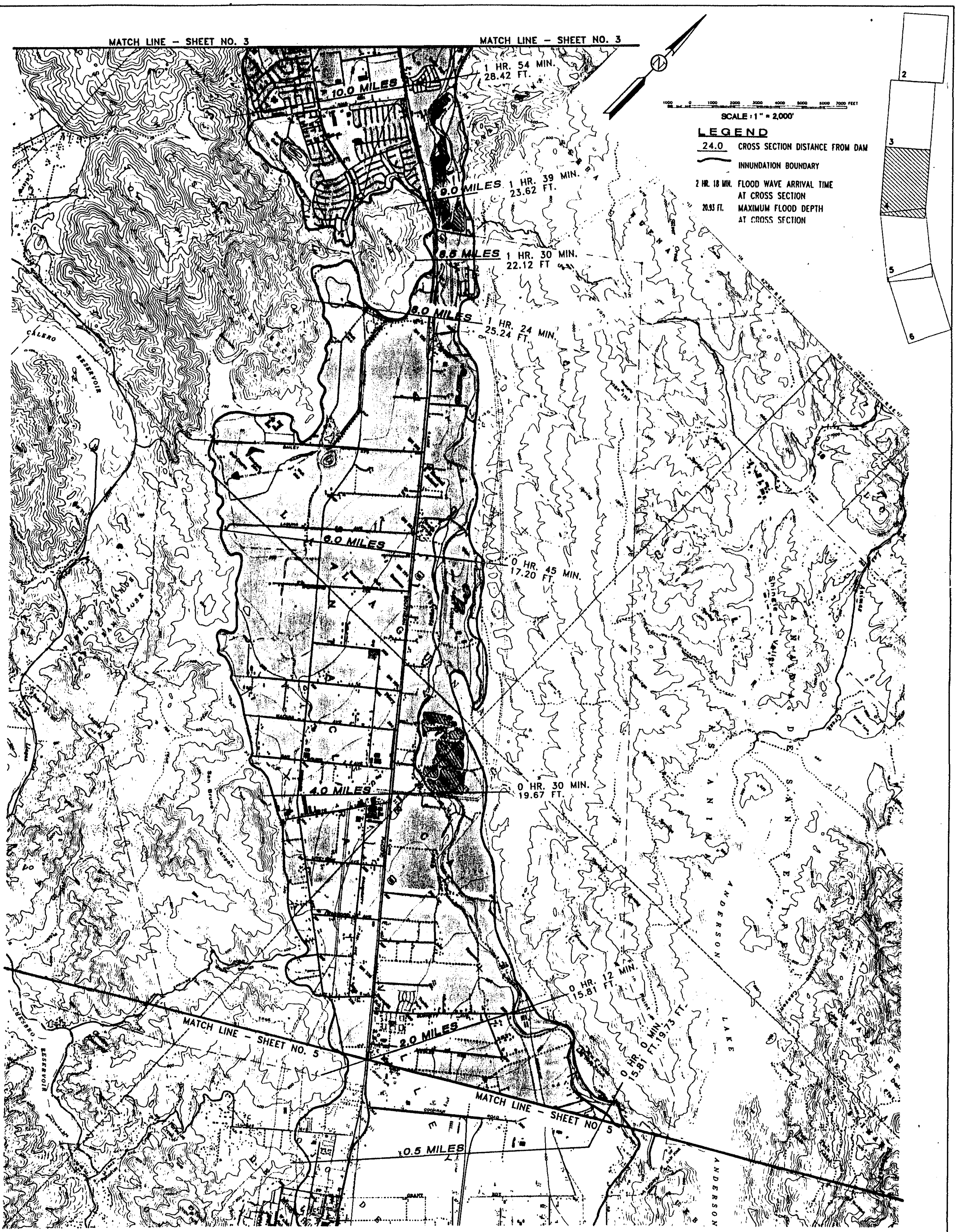
20.93 FT. MAXIMUM FLOOD DEPTH AT CROSS SECTION

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

SCALE : 1" = 2,000'

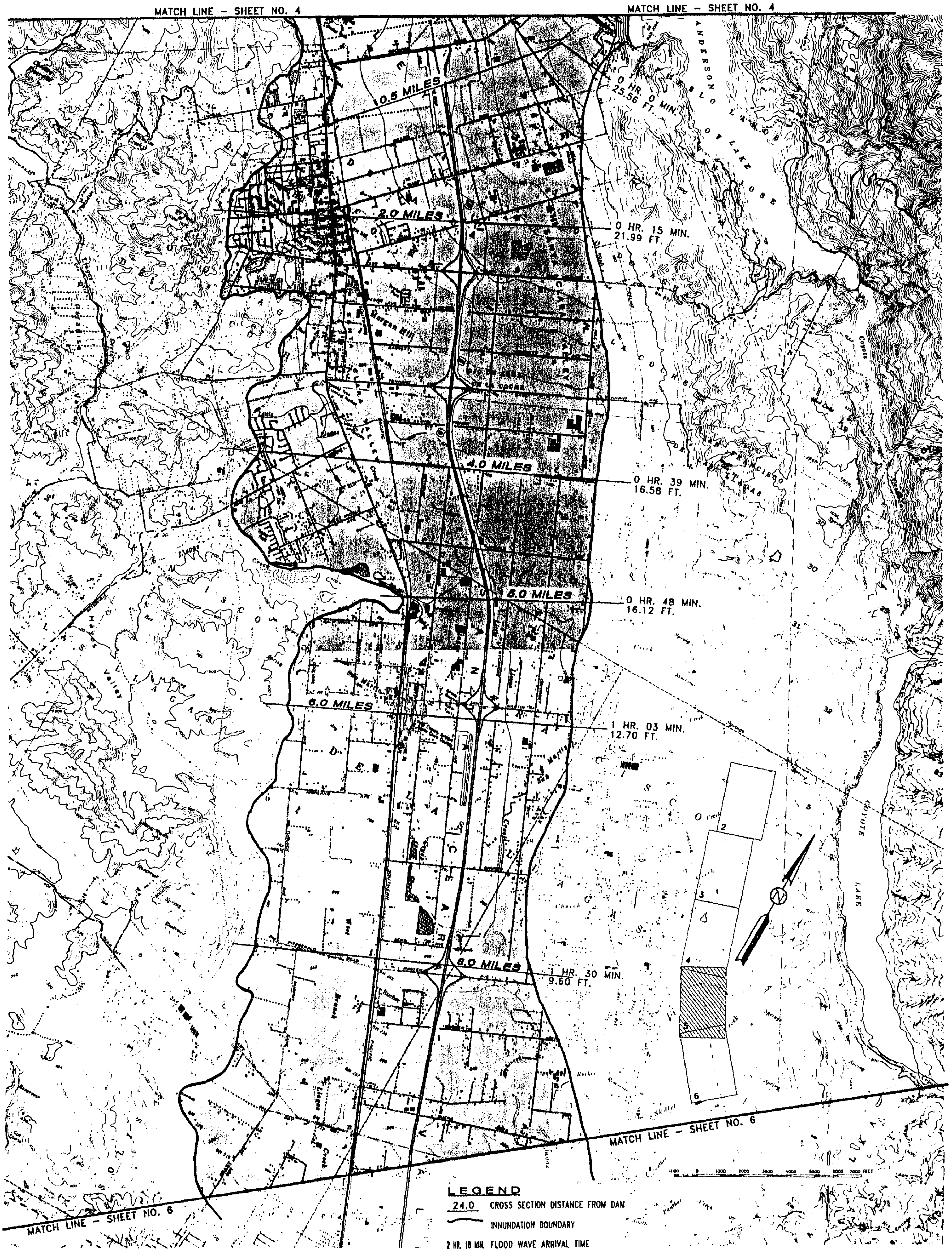
SOURCE MAP: SAN JOSE EAST 7.5' QUADRANGLE

REVISIONS		OWNER	ENGINEERING ANALYSIS BY		
BY	DATE	NAME: SANTA CLARA VALLEY WATER DISTRICT ADDRESS: 5750 ALAMADEN EXPRESSWAY SAN JOSE, CA. 95118 DATE: SEPT. 27, 1991	NAME: ENSIGN & BUCKLEY CONSULTING ENGINEERS ADDRESS: 3327 LONGVIEW DRIVE NORTH HIGHLANDS, CA. 95660 SIGNATURE: JOHN J. BUCKLEY John J. Buckley REG. CIV. ENG. NO. 16822	SANTA CLARA COUNTY DWR REGISTRY NO. ACCEPTED BY: REG. CIV. ENG. NO.	INUNDATION MAP OF ANDERSON DAM SHEET NO. 3 OF 6 DRAWING NO.



SOURCE MAP: MT. SIZER 7.5' QUADRANGLE
MT. MADONNA 7.5' QUADRANGLE
MORGAN HILL 7.5' QUADRANGLE

REVISIONS		OWNER	ENGINEERING ANALYSIS BY		INUNDATION MAP OF ANDERSON DAM
BY	DATE	NAME: SANTA CLARA VALLEY WATER DISTRICT ADDRESS: 5750 ALAMADEN EXPRESSWAY SAN JOSE, CA. 95118 DATE: SEPT. 27, 1991	NAME: ENSIGN & BUCKLEY CONSULTING ENGINEERS ADDRESS: 3327 LONGVIEW DRIVE NORTH HIGHLANDS, CA. 95660 SIGNATURE: JOHN J. BUCKLEY John J. Buckley REG. CIV. ENG. NO. 16822	SANTA CLARA COUNTY DWR. REGISTRY NO. ACCEPTED BY: REG. CIV. ENG. NO.	SHEET NO. 4 OF 6 DRAWING NO.



LEGEND

24.0 CROSS SECTION DISTANCE FROM DAM

INNUNDATION BOUNDARY

2 HR. 18 MIN. FLOOD WAVE ARRIVAL TIME AT CROSS SECTION

20.93 FT. MAXIMUM FLOOD DEPTH AT CROSS SECTION

SOURCE MAP: MORGAN HILL 7.5' QUADRANGLE
CHITTENDEN 7.5' QUADRANGLE

REVISIONS		OWNER	ENGINEERING ANALYSIS BY		
BY	DATE	NAME: SANTA CLARA VALLEY WATER DISTRICT ADDRESS: 5750 ALAMADEN EXPRESSWAY SAN JOSE, CA. 95118 DATE: SEPT. 27, 1991	NAME: ENSIGN & BUCKLEY CONSULTING ENGINEERS ADDRESS: 3327 LONGVIEW DRIVE NORTH HIGHLANDS, CA. 95660 SIGNATURE: JOHN J. BUCKLEY John J. Buckley REQ. CIV. ENG. NO. 16822	SANTA CLARA COUNTY DWR. REGISTRY NO. ACCEPTED BY: REQ. CIV. ENG. NO.	INUNDATION MAP OF ANDERSON DAM SHEET NO. 5 OF 6 DRAWING NO.
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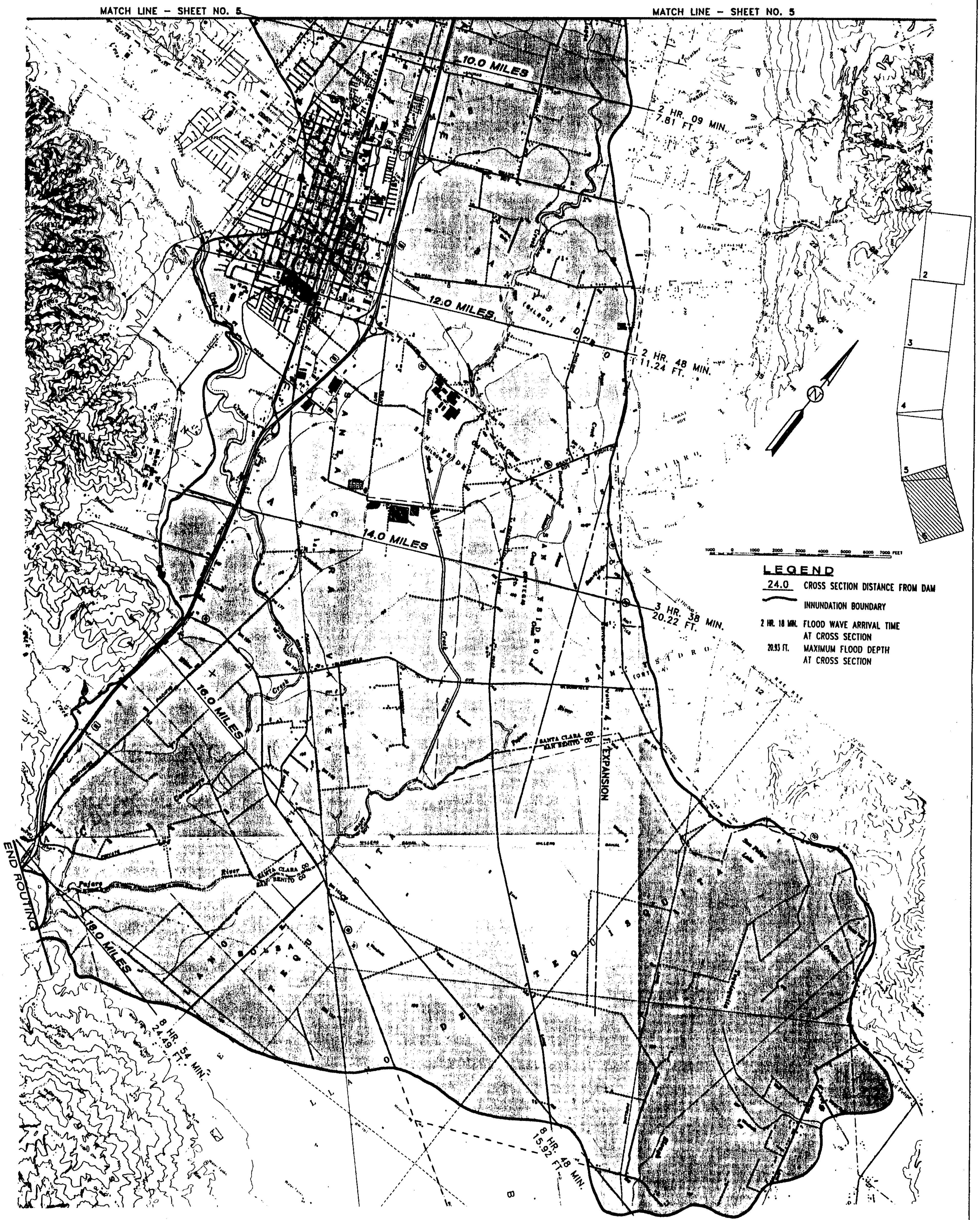

LEGEND

24.0 CROSS SECTION DISTANCE FROM DAM

INNUNDATION BOUNDARY

2 HR. 18 MIN. FLOOD WAVE ARRIVAL TIME AT CROSS SECTION

20.93 FT. MAXIMUM FLOOD DEPTH AT CROSS SECTION

SOURCE MAP: GILROY 7.5' QUADRANGLE
GILROY HOT SPRINGS 7.5' QUADRANGLE
SAN FELIPE 7.5' QUADRANGLE

REVISIONS		OWNER	ENGINEERING ANALYSIS BY		INUNDATION MAP
BY	DATE	NAME: SANTA CLARA VALLEY WATER DISTRICT	NAME: ENSIGN & BUCKLEY CONSULTING ENGINEERS	SANTA CLARA COUNTY DWR REGISTRY NO. ACCEPTED BY:	OF
		ADDRESS: 5750 ALAMADEN EXPRESSWAY SAN JOSE, CA. 95118	ADDRESS: 3327 LONGVIEW DRIVE NORTH HIGHLANDS, CA. 95660		ANDERSON DAM
			SIGNATURE: JOHN J. BUCKLEY John J. Buckley	REG. CIV. ENG. NO.	
		DATE: SEPT. 27, 1991	REG. CIV. ENG. NO. 16822		SHEET NO. 6 OF 6 DRAWING NO.